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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,247	05/07/2007	Anthony Chan	19525/101/101	2659

7590 06/21/2010

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EXAMINER	
HAMO, PATRICK	
ART UNIT	PAPER NUMBER
3746	
MAIL DATE	DELIVERY MODE
06/21/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/530,247	CHAN ET AL.	
	Examiner	Art Unit	
	PATRICK HAMO	3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 April 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,10 and 12* is/are rejected.

7)☒ Claim(s) *5-9 and 11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04 April 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *4 Feb 09*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

The claims are objected to because of the following informalities: there are two claims each labeled claims 9, 10 and 11. The second set of claims 9-11 are substantially similar to the first set of claims 9-11 and seem to be introduced in error. For purposes of examination, only the first three claims labeled 9, 10 and 11 are considered, and claim 12 is determined to be dependent on the first presented claim 10. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Chan, US, 6117,211.

Chan discloses a compressor system for gas which normally operates on a gas compression cycle but which also operates in a drier regeneration cycle, said system comprising: 1) a compressor 2 driven by a motor (undisclosed, but inherently, the compressor is motivated by some means, as the operation of a compressor requires work input to compress a gas—the motor is not restricted to the obvious variants, such as an electric motor or a fluid motor, but inherently must have a motive source, which

may be anything including manual power input), the compressor having at least a first stage inlet 1 through which passes a flow of gas being compressed from a gas supply inlet: 2) a gas delivery outlet (upstream side of compressor 2) at the outlet of the compressor, for supplying gas to a delivery line; 3) a gas drier stage 5, 6 comprising a desiccant bed 7 located in-line with the flow of gas passing through the compressor during the gas compression cycle; 4) a condenser 18 also located in-line with the flow of gas passing through the compressor during the gas compression cycle which condenser, during the compression cycle, is normally inactive; 5) temperature control means 17, 22 to control the temperatures of the desiccant bed (17) and condenser (22) which means are, during the compression cycle, inactive but, upon entering into a regeneration cycle, such means being actuatable to cause the desiccant bed to be heated and the condenser to be cooled (col. 4, lines 17-21, 48-50); and 6) valve means 3, 4, 11, 12 for switching the flow of gas from the delivery outlet to recirculate through the compressor (see fig. 3), whereby, during the regeneration cycle arising from activation of the valve means, gas trapped within the compressor, desiccant bed and condenser is redirected from the outlet of the compressor for circulation in a closed loop as a recirculating gas flow through the compressor, with at least a portion of such recirculating gas flow passing through the desiccant bed and condenser to permit water evolved from the desiccant bed to be carried by the recirculating gas to the condenser where it condenses due to the low temperature condition maintained within the condenser by the temperature control means (col. 5, lines 23-60).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chan '211 in view of Tate, Jr. et al., US 6,220,052.

In regard to claim 1:

Chan discloses a compressor system for gas which normally operates on a gas compression cycle but which also operates in a drier regeneration cycle, said system comprising: 1) a compressor 2 driven by a motor (undisclosed, but inherently, the compressor is motivated by some means, as the operation of a compressor requires work input to compress a gas—the motor is not restricted to the obvious variants, such as an electric motor or a fluid motor, but inherently must have a motive source, which may be anything including manual power input), the compressor having at least a first stage inlet 1 through which passes a flow of gas being compressed from a gas supply inlet: 2) a gas delivery outlet (upstream side of compressor 2) at the outlet of the compressor, for supplying gas to a delivery line; 3) a gas drier stage 5, 6 comprising a desiccant bed 7 located in-line with the flow of gas passing through the compressor during the gas compression cycle; 4) a condenser 18 also located in-line with the flow of gas passing through the compressor during the gas compression cycle which condenser, during the compression cycle, is normally inactive; 5) temperature control

means 17, 22 to control the temperatures of the desiccant bed (17) and condenser (22) which means are, during the compression cycle, inactive but, upon entering into a regeneration cycle, such means being actuatable to cause the desiccant bed to be heated and the condenser to be cooled (col. 4, lines 17-21, 48-50); and 6) valve means 3, 4, 11, 12 for switching the flow of gas from the delivery outlet to recirculate through the compressor (see fig. 3), whereby, during the regeneration cycle arising from activation of the valve means, gas trapped within the compressor, desiccant bed and condenser is redirected from the outlet of the compressor for circulation in a closed loop as a recirculating gas flow through the compressor, with at least a portion of such recirculating gas flow passing through the desiccant bed and condenser to permit water evolved from the desiccant bed to be carried by the recirculating gas to the condenser where it condenses due to the low temperature condition maintained within the condenser by the temperature control means (col. 5, lines 23-60). As discussed above, it is inherent that the compressor of Chan is driven by a motor. Even so, it is at least obvious that the compressor is driven by a motor, as taught by Tate. Tate teaches a compressor system including compressor 27 driven by motor 54. It would have been obvious to a person having ordinary skill in the art to provide a motor to the compressor of Chan '211 to provide motive power for the predictable result of compressing gas.

In regard to claim 2:

Tate further teaches a multi-stage compressor 27 having at least first 26 and second 37 stages, and a desiccant vessel 34 is positioned in-line between the first and second stages of the compressor. In combination, it would have been obvious to add

the additional stages of the compression system of Tate to the compressor system of Chan '211 to achieve the predictable result of producing and removing moisture from natural gas to fuel a motor vehicle. In combination, both the desiccant and condenser (as disclosed by Chan '211 in line with the desiccant) would be between successive stages of the compressor.

In regard to claim 3:

Chan '211 discloses that the condenser produces water 19 as a condensate and further comprises a semi-permeable membrane 41 through which condensed water is allowed to evaporate into the environment.

In regard to claim 4:

Chan '211 discloses that the membrane is in the form of tubing 41. As for the limitation that the tubing is filled by gravity, the pressure differences above and below aid in the filling of the tube, and this pressure difference is a result of the head of the water, resulting directly from gravity's effect pulling down the liquid.

Claims 10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi et al., US 5,506,486, in view of Itami-Kinter et al., US 4,964,788.

Hayashi discloses a compressor system 5 for gas comprising: 1) a compressor 6 (fig. 4, 203, fig. 18) having at least a first stage inlet 232 for receiving a flow of gas from a gas supply inlet 234 to be compressed; 2) a motor 202 connected to drive said compressor; 3) a gas delivery outlet 223 at the outlet of the compressor, for supplying gas to a delivery line 241; 4) a sealed casing 201 enclosing the motor, and 5) motor

control circuitry 40 for delivering of current to the motor, providing an alternating current of varying frequency to the motor (see fig. 13)

Hayashi does not disclose that the sealed casing enclosing the motor is metal, and is silent as to the position of the inverter circuitry 40, though it appears to be outside the hermetic casing in fig. 4. However, Itami-Kinter teaches a terminal casing 48 for an inverter 44 of a compressor system whereby the inverter is positioned inside a sealed casing (see fig. 1) and the terminal casing and hermetic casing 10 are both made of metal (col. 4, lines 56-64). Therefore, the wiring connecting the inverter to the motor (see fig. 1) is shielded by the casing. It would have been obvious to one of ordinary skill in the art to have modified the positioning of the inverter to the inside of the compressor instead of outside as it would have been a combination of prior art elements according to known methods (welding) that would have yielded predictable results. In regard to the claimed limitation that electromagnetic emissions arising from current being delivered from the motor controller to the motor are not transmitted outside the metal casing, this limitation constitutes an intended result of the structural limitations presented in the claim, and it has been held that a combination of references that meet the structural limitation read on the intended function limitations of such structure.

In regard to claim 12:

The motor control circuitry of Hayashi operates to create an alternating current having multiple harmonics, in the form of multiple operating frequencies (see fig. 13).

Allowable Subject Matter

Claims 5-9 and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Keefer et al., US 2003/01557390, teaches a regenerative compressor system for a fuel cell with multiple stages.

Kolodziej et al., US 6,221,130, teaches a multi-stage compressor/dryer system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PATRICK HAMO whose telephone number is (571)272-3492. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on 571-272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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